WPS5809

Policy Research Working Paper 5809

School-Based Management, School Decision-Making and Education Outcomes in Indonesian Primary Schools

Dandan Chen

The World Bank
East Asia and Pacific Region
Education Sector Unit
September 2011

Policy Research Working Paper 5809

Abstract

This paper examines the key aspects of the practices of school-based management in Indonesia, and its effect on education quality. Using a conceptual framework of an accountability system of public service delivery, the paper explores the relations among Indonesian parents, school committees, schools, and government education supervisory bodies from three tenets: participation and voice; autonomy; and accountability.

Using the data from a nationally representative survey of about 400 public primary schools in Indonesia, the paper finds that the level of parental participation and voice in school management is extremely low in Indonesia. While the role of school committees is still limited to community relations, school facilities, and other administrative areas of school management, school principals, together with teachers, are much more empowered to assert professional control of the schools. The accountability system has remained weak in Indonesia's school system, which is reflected by inadequate information flow to parents, as well as seemingly low parental awareness of the need to hold schools accountable. The accountability arrangement of the Indonesian school system currently puts more emphasis on top-down supervision and monitoring by government supervisory bodies.

The findings show that although the scope of school-based management in Indonesia is limited, it has begun to help schools make the right decisions on allocation of resources and hiring additional (non-civil servant) teachers, and to create an enabling environment of learning, including increasing teacher attendance rates. These aspects are found to have significantly positive effects on student learning outcomes.

This paper is a product of the Education Sector Unit, East Asia and Pacific Region. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The author may be contacted at dchen1@worldbank.org.

School-based Management, School Decision-Making and Education Outcomes in Indonesian Primary Schools

Dandan Chen[1]

Key words: School-based management; Decentralization; Accountability; Learning outcome; School financing; School committee. (JEL: 1C, 14P).

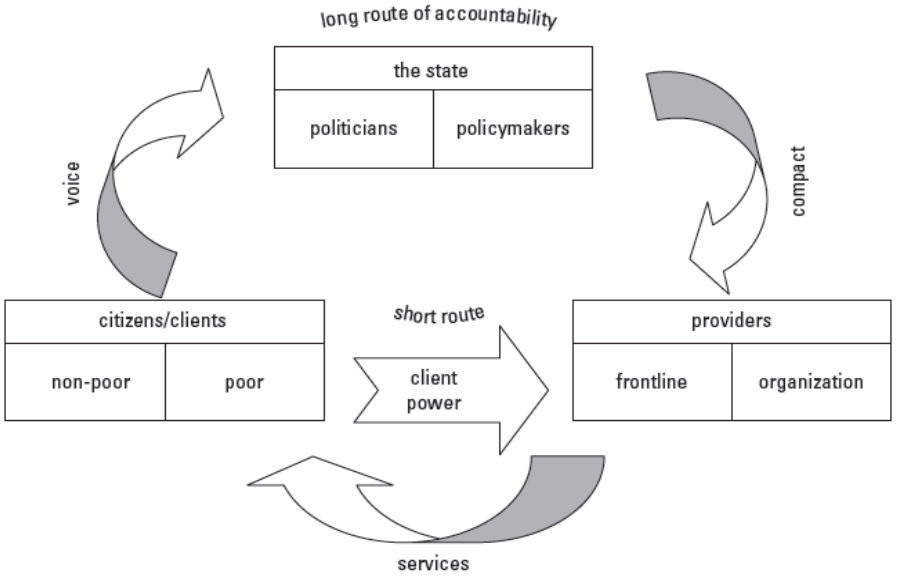
[1] Chen: Human Development Department, East Asia and Pacific Region (email: dchen1@worldbank.org). I thank Imam Setiawan for the excellent research assistance. Eduardo Velez Bustillo provided comments on an earlier draft of the paper.

I. Introduction and conceptual framework

Governments around the world are introducing a range of strategies aimed at improving the delivery of education services. One such strategy is to decentralize education decision making by increasing parental and community involvement in schools, which is commonly known as school-based management (SBM). The argument in favor of SBM is that decentralizing decision-making authority to parents and communities fosters demand and ensures that schools provide the social and economic benefits that best reflect the priorities and values of those local communities. An increasing number of developing countries are implementing SBM reforms aimed at empowering principals, teachers, and parents, or at strengthening their motivation, thereby enhancing their sense of ownership of the school. Many of these reforms have led to greater involvement of communities and parents and, in turn, have had a direct influence on educational quality. In particular, it has been found that increased participation, autonomy, and accountability are the three most important changes associated with improved quality of education and better learning outcomes.

The 2004 World Development Report (WDR) "Making Services Work for Poor People" (World Bank 2003) provides a conceptual framework for this phenomenon. The framework is presented as a three-cornered relationship between citizens, politicians, and service providers. The service provision and accountability relationships between these actors is complex, as even within each group of actors there are usually heterogeneous sub-groups, and the incentives and accountability relationships that work for one group may be different from those that work for other groups. When accountability fails, the failure can be tracked either to the long route between providers and users through policymakers, or to the short route between service providers and users directly. Sometimes improving the long route is a long-term process and, in some situations, may not be doable. In these cases, the WDR 2004 suggests strengthening the short route between providers and users (Figure 1).

Figure 1: An Accountability Framework



Source: World Bank (2003).

SBM is a direct reflection of this "short-route" approach. What successful education systems share appears to be a working structure of accountability: clear objectives, adequate resources, and capable and motivated providers. Institutional reforms should aim at strengthening the system of accountability, not only relying on the improvement of some proximate determinants of success, such as curriculum design, pedagogical methods, textbooks, teacher training, school construction, or new information technologies.

The 2004 WDR presented evidence that increasing school autonomy and accountability can help solve some of the most fundamental problems in education. According to existing evidence, while increasing resource flows and other support to the education sector is necessary, it is also critical to translate these resources into basic services that can reach the clients. Schools should be given some autonomy in using their inputs and be held accountable to the users for using these inputs efficiently. The literature that promotes the use of SBM generally points to three tenets for improving service delivery: (i) increasing client choice and participation ("*voice*"); (ii) building effective and autonomous frontline providers and organizations ("*management*"); and (iii) making information widely available, and using the information to strengthen the

rewards for delivering effective services and penalize those who fail to deliver ("*compact*").

The worldwide evidence on school-based management is well summarized in "*Decentralized Decision-Making in Schools*" (World Bank, 2009). The general finding is that SBM shows positive results on mainly reducing grade repetition and failure, and improving teacher attendance rates, contrasted with the mixed results in test scores.

II. Indonesian context

Indonesia is a very large country geographically, with more than 200,000 schools nationwide. Decentralizing service delivery is a natural response to concerns about the ability of central policymakers to respond to the needs of a large and diverse country. Since 2002, Indonesia has sought to address structural problems in the legal and legislative framework governing education service delivery. The government has formalized first SBM-principles with Decree No. 044/U/2002 (Ministry of Education, 2002) on the Education Board and School Committees (SC). The Decree defined the school committee as the community representative body at the school level with membership comprising parents, community leaders, education professionals, private sector, education associations, teachers, NGOs and village officials. It must comprise a minimum of nine members and the chairperson must come from outside the school.

The idea of the school committee is based on the enlargement of the old style BP3 (Parents-Teachers Association) and aimed at accommodating wider participation from the parents and the community, empowering them in decision making, and holding schools accountable so as to improve education access and quality on the ground. The expectation was that SBM would lead to more efficient use of resources and improved student achievement. The Decree explicitly stipulates that SC objectives should include: (1) to accommodate aspirations of the community on operational policies and education sector programs at the education unit (school level); (2) to encourage more community roles in education provision at the school level; and (3) to facilitate the establishment of education service provision at the school level in a transparent and accountable manner.

Education Law No. 20/2003 also defines the District Education Board as an independent body representing civil society at the district level with the aim of improving

education service delivery. The committee supports this improvement by: (1) providing *advice* to assist in determining the school program and policy; (2) providing *support* such as financial support, ideas, and activities for the implementation of the school program; (3) providing *control* over school programs for transparency and accountability; and (4) providing *mediation and communication* between the school and the community.

Compared to international practices particularly in Latin America, the practice of SBM in Indonesian is very much limited in public schools. The majority of the teachers are public civil servants, whom the schools have no power to hire or fire. In theory, schools have only control over non-salary operational expenditures, even though the discretionary resources are commonly used to hire additional contract teachers.

International partners have supported SBM in Indonesia for more than 10 years. The Ministry of National Education (MoNE) has even established a SBM Secretariat to integrate programs. The donor programs that can be broadly categorized as supporting SBM include: Creating Learning Communities for Children (CLCC) with UNICEF and UNESCO; Decentralized Basic Education Project (DBEP) with Asian Development Bank; Regional Education Development and Improvement Program (REDIP) with JICA; Managing Basic Education and Decentralized Basic Education (DBE) with USAID; and Australia Indonesia Basic Education Program (AIBEP) with AusAID.

There is a small but growing research literature devoted to school-based management in Indonesia. The evidence on school committees is based mainly on qualitative case studies across a range of provinces. The SMERU Institute studies from 2005 and 2008 focused on school committee participation in school management, as well as the school budgeting process that accompanies receiving the BOS block grants (RAPBS). They found school committees were often dominated by school principals, with the help of selected teachers. Committees generally concentrated in raising funds for the school to use on facilities, and rarely entered into areas related to teaching and learning. Participation within the committees was limited, and often dominated by the committee leader, who may be a respected figure in the community (such as a former school principal). However, these committees were seen as potentially effective communicators of complaints from parents about actions within the school, including disciplinary episodes.

A number of factors appear to contribute to the relatively weak position of the school committee vis-à-vis school personnel, especially the principal. The first is that committees are not perceived as having relevant expertise for entering into questions related to management, teaching and learning. Another factor was referred to as an institutional legitimacy issue, since the school principal receives his/her decree from the district office, while the school committee is appointed locally. Finally, with the introduction of the "School Operational Assistance"[2] (*Batuan Operasional Sekolah, BOS*) grants, one of the main historical functions of the school committees—raising funds—has been reduced in importance (SMERU, 2005, 2008).

The school's use of the BOS grant money is another area of research. The main benefit from the program appears to be the supplanting of school-based fees, at least in rural areas (SMERU, 2008). This does not mean that local fees have been abolished, but the additional funds appear to be used to purchase the materials and inputs that were financed largely by parental fees before. This in turn has positive implications for participation, since the price of school has in effect been lowered.

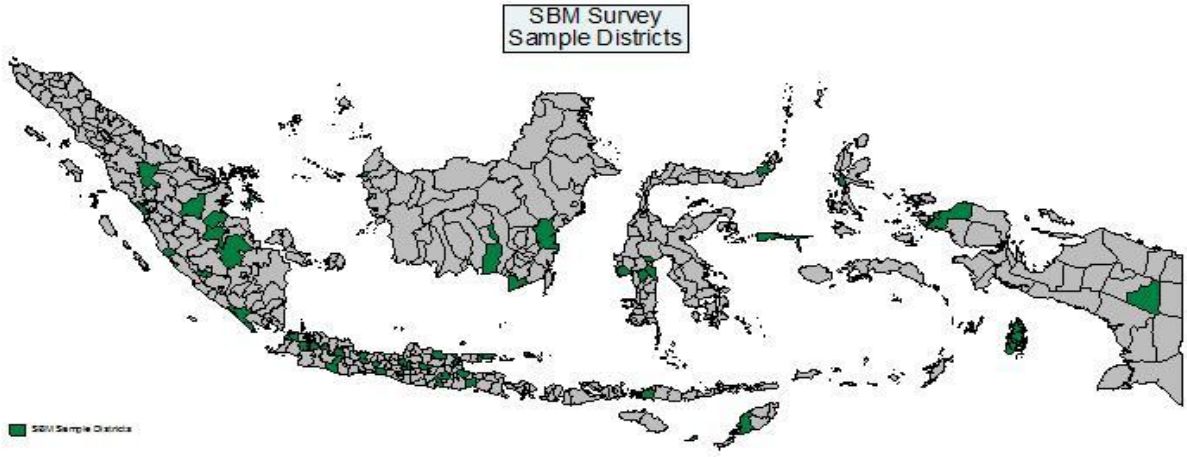
As for how schools use the grant money, the evidence is mixed. As mentioned in Sweeting et al. (2003-07), on the one hand there are instances of qualitative improvements, for example, through enhanced teacher training. But the evidence suggests a general emphasis on materials and physical infrastructure, rather than learning processes. Also, not every community has necessarily welcomed the BOS program. In some urban areas there is evidence of schools declining BOS in favor of maintaining a school fee system that generates more resources, although this puts more pressure on the poorest families. In other areas there are concerns about district-level diverting of the funds. Finally, there is the concern raised above that one side effect of the BOS program is that it indirectly weakens the position of the school committee given its historical role as local fundraiser.

[2] Capitation grant to primary and junior secondary schools started in 2005, currently in the amount of about US$ 40 per pupil at primary level, and approximately US$ 60 at junior secondary level.

III. The SBM survey 2010 and a brief overview of the status of SBM in Indonesia

In April 2010, the World Bank, in collaboration with the RAND Corporation and Survey Meter, carried out a sample survey of 400 public primary schools[3] in Indonesia spreading over 54 districts. Interviews were carried out with 400 principals, 781 school committee members, 1,953 teachers, and 2,400 parents. In addition, 54 heads of district (*Kabupaten*) or municipality (*Kota*) education offices, 47 heads of sub-district (*Kecamaten*) education offices, 52 chairs of the district education board, and 54 of chief school inspectors in each district were also interviewed. Selected Grade 5 pupils in each surveyed school were tested in Indonesian language and mathematics[4].

Figure 2: Distribution of 54 sampled districts



Consistent with national data, the average size of the sampled primary school is small, at 180 students on average per school. The student-teacher ratio is generally low, around 15:1. Schools' discretionary resource envelopes, excluding public civil service teachers' salaries that are directly paid to teachers, is also in general small, but varies from region to region.

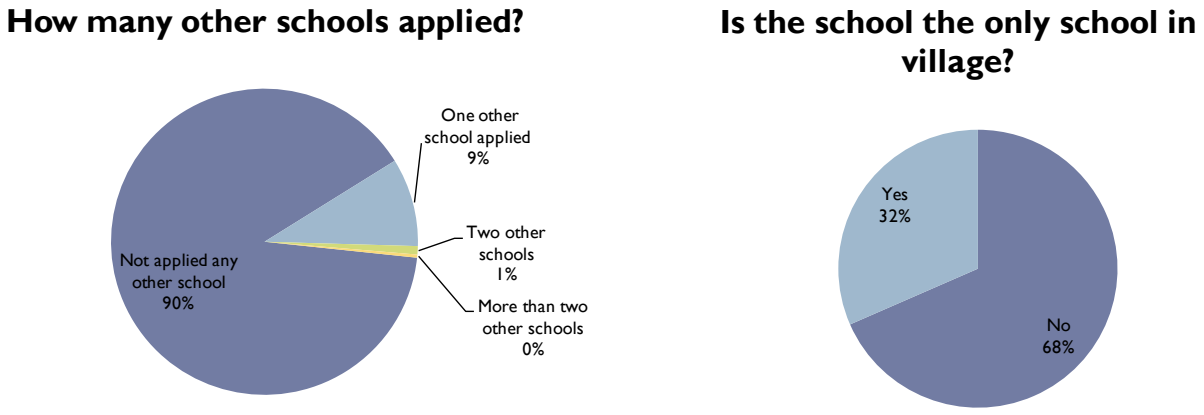
The survey aims at capturing the current practice of SBM in Indonesia, after nearly 10 years of its principles written into law. The survey has shown that in general the scope of SBM continues to be very limited in Indonesian public primary schools. In terms of the first key tenet of SBM - parental choice, participation, and voice, 90%

[3] These are the public primary schools under the auspices of the Ministry of National Education, comprising about 90 percent of total primary schools in Indonesia. The other 10% mostly include private schools and the schools under the Ministry of Religious Affairs (mostly private schools).

[4] The survey also included 54 public junior secondary schools, one in each sampled district. This paper focuses on the 400 public primary schools only.

surveyed parents did not actively choose schools, even though nearly 70% do have other choices in the same village (Figure 3).

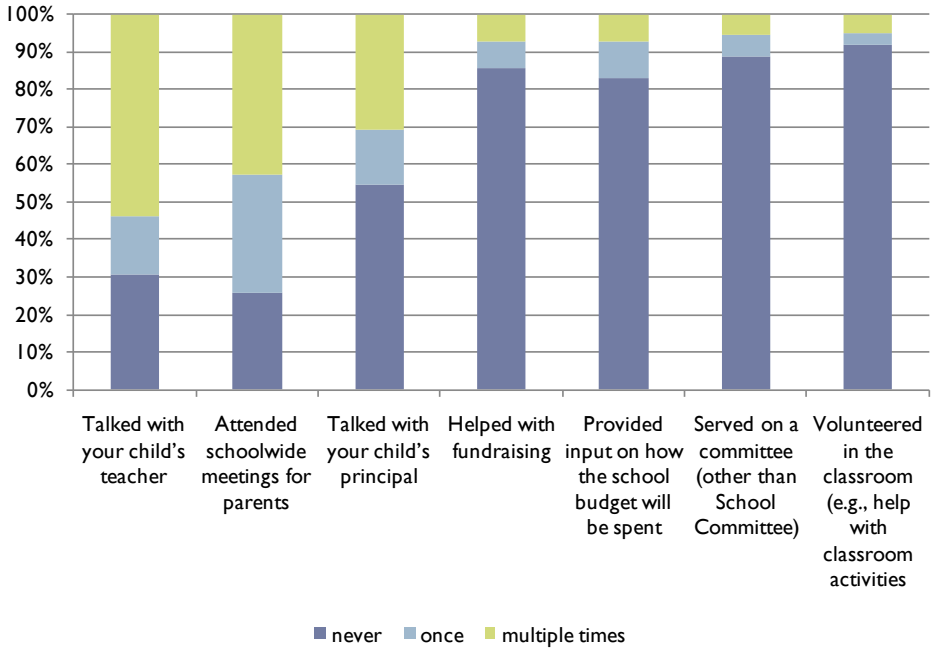
Figure 3: Parental choice of schools



Source: SBM Survey 2010, World Bank.

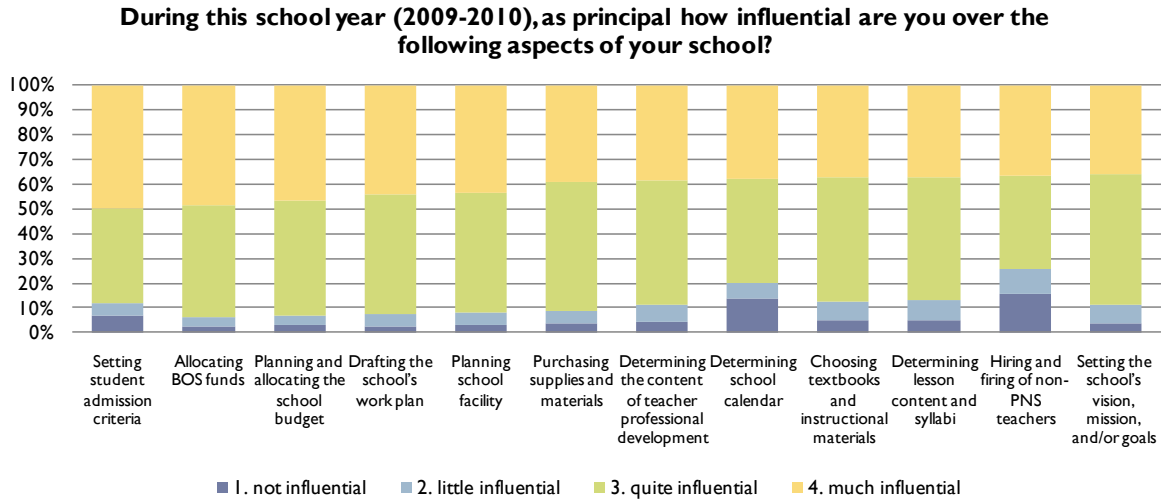
Parental involvement in school affairs tends to be low. The limited involvement is mainly interactions with teachers or principals on issues related to their own children, or attending regular parents' meetings with schools. Over 80% of the parents have neither provided any inputs to school, nor volunteered in school activities, such as serving as a committee member, helping classroom activities, or raising funds for schools (Figure 4).

Figure 4: Parental participation of school affairs



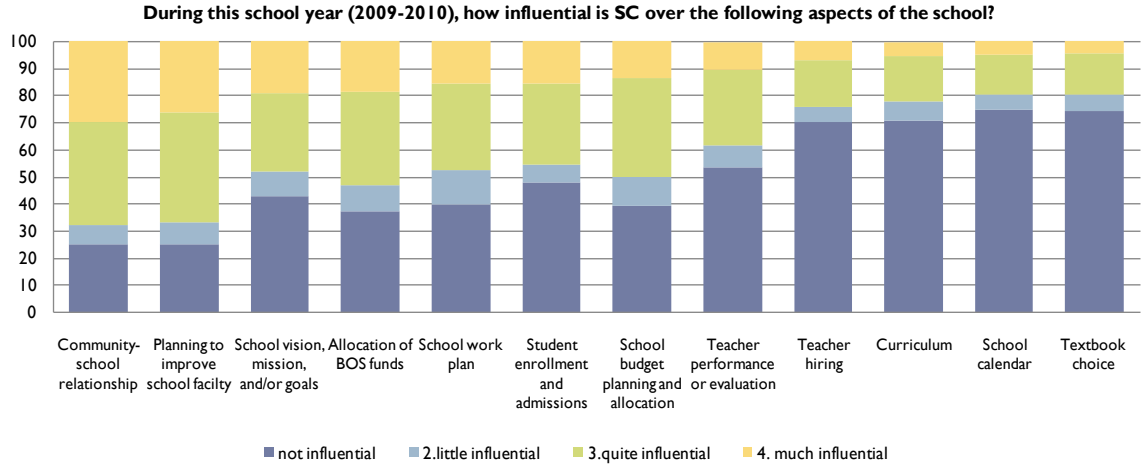
School management and autonomy is the second tenet of SBM. Even though Indonesia cancelled the school/university autonomy law in early 2010, the survey shows that in practice, school principals continue enjoying much freedom of decision-making at schools. They generally feel much empowered in influencing various aspects of educational management: student admission; school timetable; budget and planning; managing teachers; school facilities as well as teaching and learning materials including curriculum contents. They appear to have both "administrative control" and "professional control" of the school activities (Figure 5).

Figure 5: School principals' influence on various school affairs



In comparison, school committees largely feel less control of school decision-making. School committees report that their most influential area is community-school relations, following by planning for school facility improvement. Around half of the school committees in the survey responded that they had little or no influence on school vision and mission, budget allocation and work plan.

Figure 6: School committee's influence on various school affairs

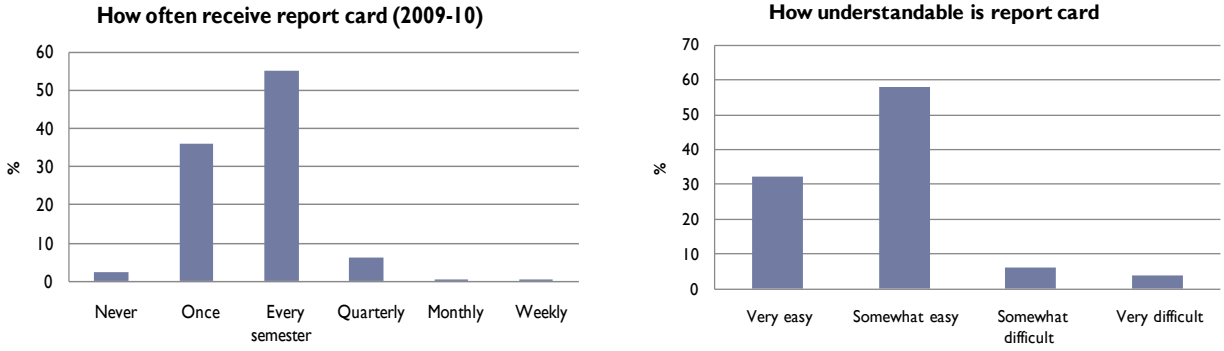


The least influenced areas by school committees fall under the "professional control" side of the school: textbooks choice, school calendar, curriculum, and teacher management.

The dichotomy of principal vs. school committee on school management is to some extent understandable within the institutional context. With the ownership of the Indonesian public schools still falls under the government, and generally categorized as "technical unit" in the government structure with assigned budget headings, the principal, as an appointed government employee, is responsible for this "unit" and allocated public budget. With increased share of public funding at school level in recent years, it is natural to expect that the principal's role is likely to be enlarged.

The third tenet of SBM is transparency and accountability. Regarding information flow from schools to parents, the report card on individual child's academic performance, mostly semester test results, is regularly sent to parents, and they are generally easy for parents to understand (Figure 7).

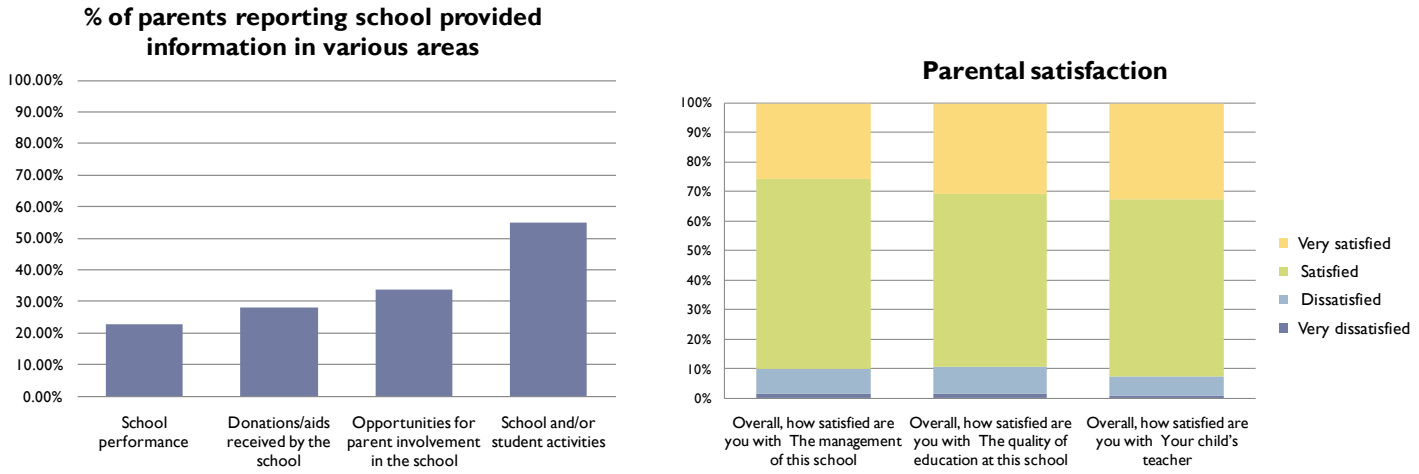
Figure 7: School report card received by parents



Beyond report cards on students' performance at school, other information regarding school activities and management is not commonly communicated to parents. Only about 20% of the parents surveyed responded that they received some information on overall school performance[5]. Similarly quite low share of parents reported that they learned anything about school finance or were encouraged to volunteer in school activities. Only half of the parents interviewed actually received any information about school and student activities (Figure 8, left panel).

[5] This is not well defined, a weakness of the survey.

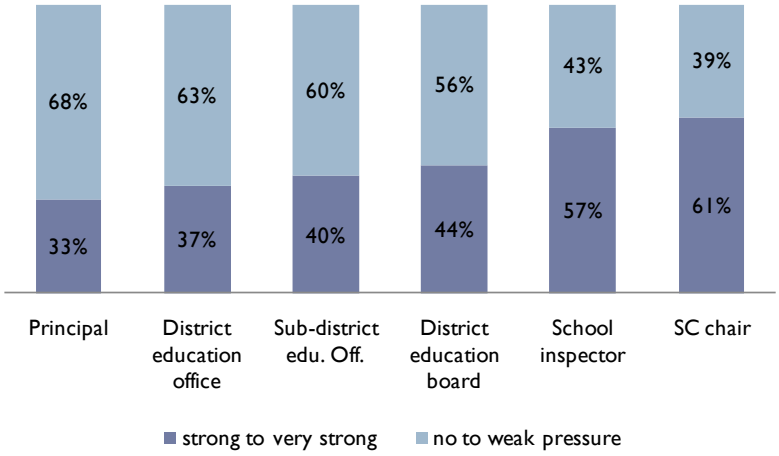
Figure 8: Information flow to parents and parental satisfaction



Paradoxically, with little interaction with schools, and infrequent information supplied by schools, a large majority of parents are either satisfied or very satisfied with school quality, management, and their children's teachers (Figure 8, right panel). This appears to cast doubt on whether the accountability of schools to parents would work in Indonesia, where community harmony is highly valued, and a majority of parents are reserved and do not openly complain or express dissatisfaction.

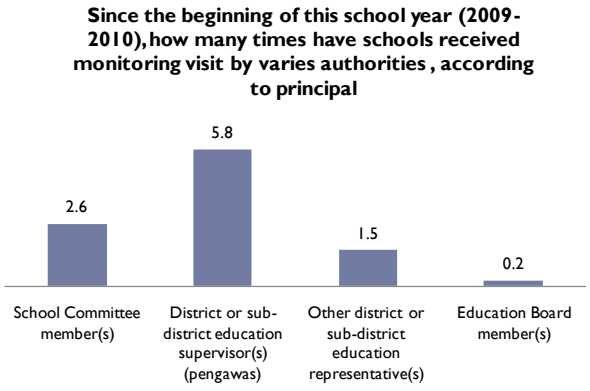
This doubt is somewhat verified by the responses of schools and districts on the pressure they felt for improving education quality. Of those surveyed, 68% of the principals and 63% of the district education officers responded that there was little to no pressure from parents to improve education. The school committees, district education boards (DEB), and school inspectors seem to view the pressure as slightly higher. However, they are in general on the "giving" end, but not the "receiving" end of the pressure, and thus may have biased views on the pressure that parents actually put on schools (Figure 9).

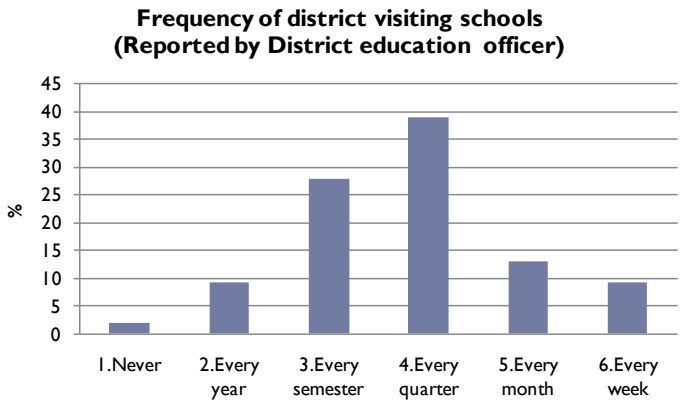
Figure 9: Pressure from parents to improve student performance: viewed by various stakeholders



The bottom-up pressure from parents seems weak in Indonesia's public primary schools, but the top-down pressure from government supervisory bodies is slightly more significant. Figure 10 shows that schools are frequently visited by school inspectors from the district education office. Schools on average receive nearly 6 visits by the district school inspectors per year. This is somewhat verified by the district's response that quarterly and monthly school visits are common by the districts.

Figure 10: School visits by district



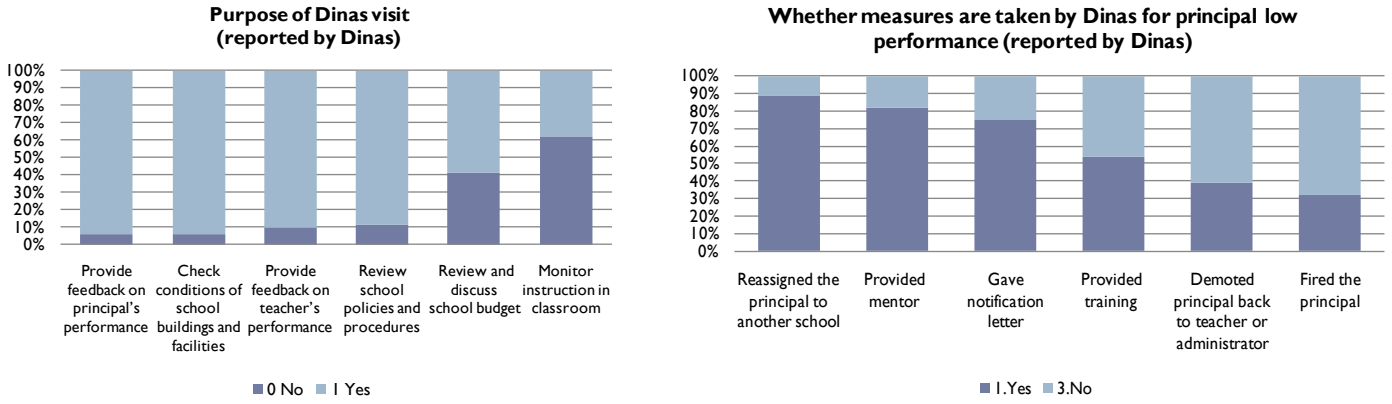


What happened during and after the district's visit to schools? Even though the visits are frequent, it seems that the key aspects of quality assurance and consequences are missing from these visits. For example, monitoring instruction inside classrooms is not commonly covered during these visits, and reviewing the school budget is also not a

routine task of the supervisors. This leads to the question of what the feedback given to principals and teachers is mostly based on, or whether the evaluations and feedback, together with other inspection areas (i.e. school facility and administrative procedures) are superficial.

In addition, the consequences for poor performance rarely lead to any high-stake actions. The most common measure taken for a low-performing principal is a transfer to another school or placement with a mentor. Demotion and firing would only happen with more serious offenses (Figure 11).

Figure 11: Top-down accountability



In brief, Indonesia has joined the global trend of decentralization of educational decision-making. Schools are empowered to make decisions on administrative and technical matters. However, Indonesia does not seem to get the best from the current SBM practice. The level of parental participation, transparency, and accountability needs to be elevated to enable the country to reap the full benefit of SBM in improving the quality of education.

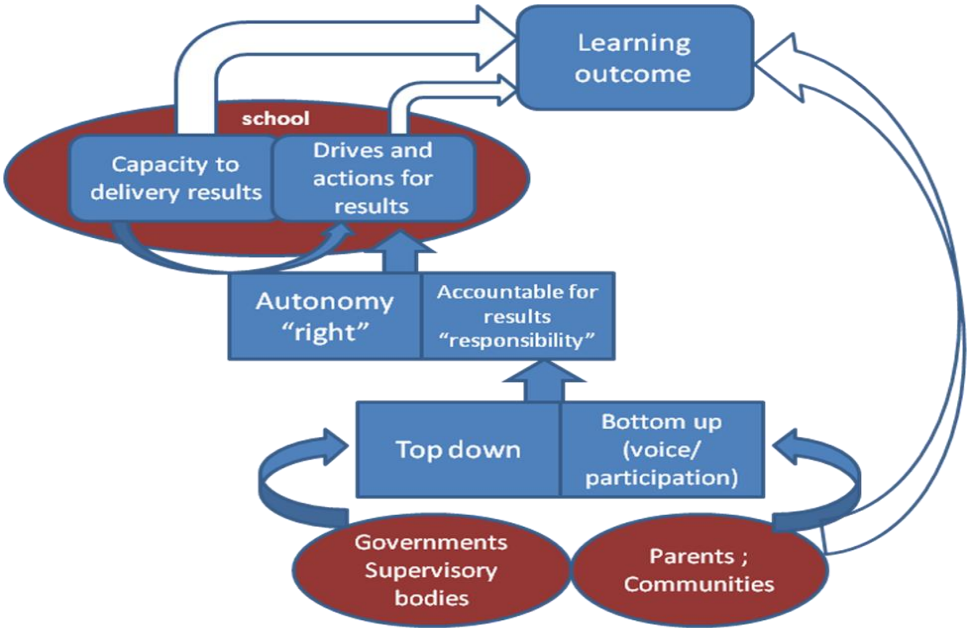
IV. Estimating the effects of school decision-making

This section provides empirical evidence on whether school level decision-making actually leads to improved education outcomes in Indonesia. The scope of school decision-making in the country is still limited, given that a majority of teachers are civil servants, who are assigned to schools. Therefore decision-making at the school level is limited to its relatively small discretionary resource envelope. But there are key areas in which schools can and have been making choices. We look into two of these areas:

hiring non-civil servant (contract) teachers, and allocating discretionary resources. We examine what factors are associated with school choices, and how these choices affect student learning outcomes at the school level.

We follow an analytical framework as graphed in Figure 12. As depicted, school outcome is determined by three sets of factors: the school's capacity to deliver results; the school's drive and actions for results; as well as students' family and community background. The school's drive and actions for results are of particular interest in the context of SBM: they are affected by how much autonomy schools have, together with the extent to which schools are held accountable for their results.

Figure 12: An analytical framework of school outcome



Source: Author compilation.

Schools can be held accountable by parents and communities (bottom-up accountability), as well by government supervisory bodies (top-down accountability). In Indonesia, the former is often regarded as through the school committee, and the latter, the district education office.

The approach for empirical estimation is summarized in Table 1.

Table 1: Empirical approach to estimate school decision-making and its effects on school results

	Equations	
	(1) *Outcome equation*	*(2) (3) (4)* *School decision/ intermediate outcome equation*
Dependent :	*Learning outcome*	*-Resource use* *-Non-PNS hiring* *-Teacher attendance*
Explanatory:		
School level:		
	Resources	Resources
	Principal experiences	Principal experiences
	Teacher qualification	Teacher qualification
	Teacher experiences	Teacher experiences
	Various training	Various training
	Resource allocation	
	Teacher hiring	
	Teacher attendance	
Government level :		
		Report requirement
		Meetings and visits
		Rewards and sanctions
Community level:		
		Report to parents and communities on results
		Multiple schools to choose from
		Pressures to schools Direct participation in school mgmt
	Parental resources	
	parental education	

A two-step procedure is used to address the endogeneity of school decision variables when explaining the school outcome. As summarized in Table 1, the first step

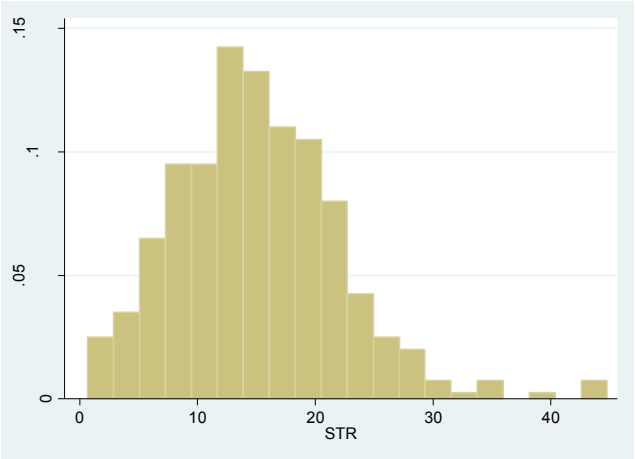
estimates school decision equations of (1) school budget allocation for student activities, particularly in support of learning such as remedial learning activities; and (2) the number of non-civil service ("non-PNS") teachers hired by schools. We also include in the first step the estimation of one important intermediate outcome measure: teacher attendance rate. The predicted values of the first step dependent variables will serve as key variables to explain the school outcome: test scores of Indonesian language and math.

While school capacity variables such as principal and teachers' qualification and experiences enter both equations, the "accountability" variables only affect school outcomes through influencing school decision-making, and thus they are excluded from the 2nd step estimation. In the meantime, parental educational background and resources are regarded as only affecting learning outcome directly. This is a reasonable assumption as highly educated or well-heeled parents can only be highly influential if they are involved in school activities in the first place. The descriptive statistics of the variables used in the estimation are presented in Annex 1.

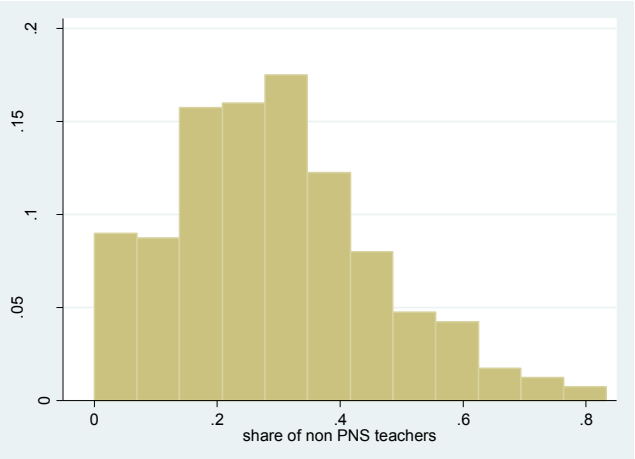
The sample includes 383 schools. 13 schools in the survey actually responded that they do not have school committees, and thus are excluded from the sample. Using discretionary funding for hiring non-civil service teachers seems to be a common phenomenon, even though the student-teacher ratio is very low at average of 15:1 for the sample. On average, 30% of the teachers in the surveyed schools are non-civil service teachers (Figure 13).

Figure 13: STR and share of non-civil service teachers

a. Student-teacher ratio



b. Share of non-civil service teachers

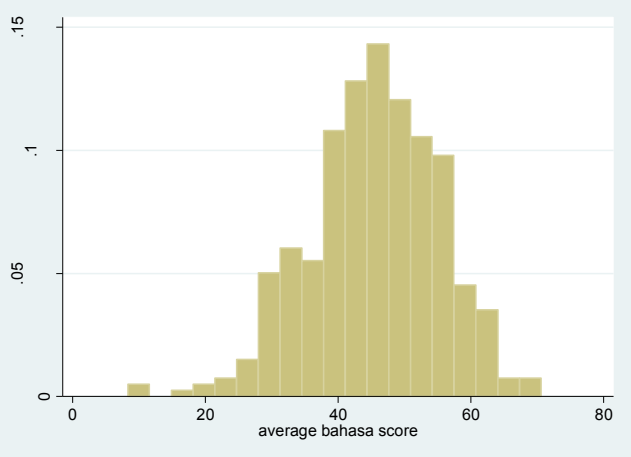


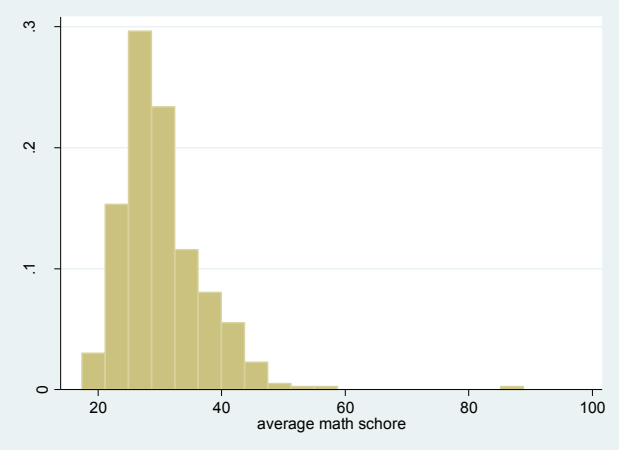
Teacher absenteeism has been an issue in Indonesia. Chaudhury et al (2006) reported that 19% of Indonesian teachers were absent from work. Our survey relies on the principal's estimate, and has a much better record of 6% absence rate. However, the variations remain large from school to school.

We use the average test scores for Indonesian language and math to measure the school outcome. The test is administered to the Grade 5 students in surveyed schools, and designed based on the core curriculum requirements. Students generally fair better in language than in math. Language test score also shows smaller standard deviation than math score.

Figure 14: Distribution of Indonesian language and math test score

a. Indonesian language b. Math





The results of first step estimates are presented in Table 2[6]. For schools' direct spending on student activities, in addition to the significant effect of schools' total budget and total enrollment, the result shows that the amount of spending is significantly affected by the influence of districts or subdistricts. Schools that reported districts/sub-district as "very influential" over schools "planning and budget allocation" allocated more funds directly to support student activities. In addition, schools that send parents information on BOS spending also spend more on their students directly. Schools with a committee chair with at least senior secondary education also tend to spend more on

[6] Full results in Annex 2.

students. Somewhat consistent with the effect of the district/subdistrict's influence, schools with more teachers trained at the district level during the previous year also allocate greater spending on students.

The district/subdistrict's influence is also shown in the school's decision to hire non-civil service teachers. It seems that when there is more influence of districts on schools' "professional" aspect (i.e., selection of textbooks and other instructional materials), schools are more likely to hire additional non-civil servant teachers. Various school committee-related activities appear to have different effects on teacher hiring. Schools that report student performance to their school committees tend to hire more teachers. In the mean time, more active schools committees - as reflected by more frequently reporting of committee activities to parents; or more school committee meetings with parents and communities - seem to reduce the additional teacher hiring.

Controlling for total enrollment, schools with fewer civil-service teachers do tend to hire more non-civil service teachers. This shows that hiring additional teachers does have a compensatory effect, equalizing the student-teacher ratio across schools. One interesting finding is that better teacher management and training is negatively associated with additional teacher hiring. The results in Table 3 show that the share of teachers in schools receiving evaluations from the principal, and the share of teachers receiving training on handling classroom discipline issues and general classroom management, have significant and negative effects on additional teacher hiring. This may reflect a quality-quantity trade-off of teachers.

Table 2:1st Step estimates: School decisions and intermediate outcome

VARIABLES		Expenditure on student *bk08_as03E* coef	se	Number of non-PNS teachers *T_nonPNS* coef	se	Teacher attendance rate *Teacher_attend* coef	se
Top down:							
_Ibk05_ao01a4	Dummy, =1 if very influential district/sub district over planning and allocating school's budget	4.201e+06**	(2.078e+06)	0.0878	(0.460)	3.702	(3.675)
_Ibk05_ao01c3	Dummy, =1 if somewhat influential district/sub district over determining the content of teacher professional development	1.647e+06	(2.357e+06)	-0.336	(0.523)	7.359*	(4.175)
_Ibk05_ao01c4	Dummy, =1 if very influential district/sub district over determining the content of teacher professional development	-1.128e+06	(2.550e+06)	-0.352	(0.566)	9.723**	(4.518)
_Ibk05_ao01d2	Dummy, =1 if little influential district/sub district over selecting textbooks and instructional materials	-2.088e+06	(1.870e+06)	0.592	(0.415)	-5.588*	(3.312)
_Ibk05_ao01d3	Dummy, =1 if somewhat influential district/sub district over selecting textbooks and instructional materials	-1.340e+06	(1.719e+06)	0.680*	(0.381)	-2.998	(3.045)
_Ibk05_ao01d4	Dummy, =1 if very influential district/sub district over selecting textbooks and instructional materials	-1.403e+06	(2.052e+06)	0.868*	(0.456)	-6.011*	(3.636)
bk05_ao03x	Dummy, =1 if principal have attended a meeting with the district education office staff	4.834e+06	(4.212e+06)	1.961**	(0.935)	-1.277	(7.462)
Bottom up:							
_Ibk05_ks03a1	Dummy, =1 if the roles of school committee is to provide inputs in the allocation of BOS funds	2.172e+06	(1.534e+06)	-0.254	(0.340)	4.795*	(2.718)
bk05_pt07A	Dummy, =1 if school send all parents written information about school performance	-706,430	(1.274e+06)	0.377	(0.283)	-6.539***	(2.256)
bk05_pt07B	Dummy, =1 if school send all parents written information about use of BOS funds	2.432e+06*	(1.450e+06)	0.00623	(0.321)	0.712	(2.566)
bk05_pt07C	Dummy, =1 if school send all parents written information about school committee activities	1.637e+06	(1.488e+06)	-0.565*	(0.330)	1.829	(2.637)
bk06_ks20A	Dummy, =1 if School Committee received information on the school's teachers and their performance	-2.048e+06	(1.357e+06)	-0.0605	(0.300)	4.061*	(2.396)
bk06_ks20B	Dummy, =1 if School Committee received information on students and their performance	2.029e+06	(1.770e+06)	0.713*	(0.393)	-4.641	(3.137)
age_chair	Age of School committee Chairman	-27,396	(57,469)	-0.0109	(0.0128)	0.207**	(0.102)
D_edu_chair	Dummy, =1 if School Committee Chair has education senior secondary or above	2.158e+06*	(1.227e+06)	-0.0288	(0.272)	4.001*	(2.172)
bk06_ks08xC	Dummy, =1 if School Committee held meetings with parents and/or community members	-256,234	(1.333e+06)	-0.515*	(0.296)	3.624	(2.360)
School characteristics and capacity							
bk08_as03R	School total budget	0.0141***	(0.00243)	9.13e-10*	(5.38e-10)	8.21e-09*	(4.29e-09)

		Expenditure on student		Number of non-PNS teachers		Teacher attendance rate	
		bk08_as03E		*T_nonPNS*		*Teacher_attend*	
VARIABLES		coef	se	coef	se	coef	se
D_accredit	Dummy, =1 if school is accredited	-1.335e+06	(1.207e+06)	0.871***	(0.268)	2.312	(2.135)
R_admission	Ratio of application / admission	-1.672e+06	(1.865e+06)	-0.343	(0.414)	2.797	(3.305)
T_enroll	Total enrollment	38,275***	(6,037)	0.00757***	(0.00134)	-0.0151	(0.0107)
T_PNS	Number of civil servant teachers	215,647	(179,504)	-0.170***	(0.0398)	0.213	(0.318)
bk05_pc08B	Dummy, =1 if school receives assistance from District or sub-district education staff	-899,001	(1.201e+06)	-0.176	(0.267)	3.522*	(2.128)
bk05_pc08C	Dummy, =1 if school receives assistance from Private foundations/donors	-843,199	(3.343e+06)	1.179	(0.742)	-14.25**	(5.924)
bk05_ao04G	Dummy, =1 if Principal received training for involving parents and community members in supporting the school	-2.383e+06	(1.518e+06)	-0.119	(0.337)	6.273**	(2.686)
Dfemale	Dummy, =1 if school principal is female	-1.256e+06	(1.190e+06)	-0.546**	(0.263)	2.689	(2.101)
age	Principal's age	-152,927	(116,072)	-0.0522**	(0.0256)	0.710***	(0.205)
bk09_pj03a	Share of teachers receiving an oral performance evaluation from principal	-21,276	(2.255e+06)	-1.070**	(0.500)	1.370	(3.995)
bk09_pj03b	Share of teachers receiving a written performance evaluation from principal	3.341e+06*	(1.943e+06)	0.0514	(0.431)	-1.043	(3.440)
bk09_kg03xA	Share of teachers receive training from national government	-1.573e+06	(5.332e+06)	-0.405	(1.184)	16.64*	(9.447)
bk09_kg03xB	Share of teachers receiving training province government	5.262e+06	(3.418e+06)	-0.0174	(0.758)	-15.17**	(6.047)
bk09_kg03xC	Share of teachers receiving training from district or subdistrict Education Office	-8.056e+06**	(3.318e+06)	-0.109	(0.736)	-1.566	(5.878)
bk09_kg04A	Share of teachers receiving training in: Handling classroom management and discipline situations	-3.902e+06	(4.124e+06)	-2.675***	(0.915)	-5.592	(7.306)
bk09_kg04B	Share of teachers receiving training in: Planning lessons more effectively	-608,698	(4.981e+06)	-0.196	(1.105)	20.46**	(8.816)
bk09_kg04D	Share of teachers receiving training in: Teaching your subject matter or grade level	-1.471e+06	(4.483e+06)	1.650*	(0.995)	-3.291	(7.938)
bk09_kg04H	Share of teachers receiving training in: Planning for the allocation of BOS funds	4.733e+06	(4.499e+06)	0.224	(0.999)	15.51*	(7.970)
Constant		-1.952e+06	(9.688e+06)	5.305**	(2.146)	42.88**	(17.12)
Observations		383		384		384	
R-squared		0.627		0.346		0.287	

The teacher attendance rate also seems to be significantly affected by how much the district/subdistrict influences the schools. However, the results show that a district's "administrative influence" (i.e., influence on school planning and budgeting) has a positive effect, while its "professional influence" (i.e., influence on textbook selection) seems to have a negative effect on teachers' attendance rate. The school committee appears to have a significant effect on teacher attendance. We have found that schools with committees receiving teacher performance reports have significantly higher teacher attendance rates. An experienced and better educated school committee chair is also associated with better teacher attendance[7].

Table 3 presents the 2nd step estimates of school outcomes[8]. Predicted values are used to capture the effect of school decisions and intermediate outcomes. The results show that among the school decision and intermediate outcome variables, school spending on student activities, the number of non-civil service teachers, and the teacher attendance rate all have significant effects on math scores, controlling for other school and parent characteristics. In the meantime, only the teacher attendance rate shows a significant effect on language scores.

Teacher quality and management stand out as important factors in test scores. Both the share of teachers receiving training from districts or other sources, and the share of teachers receiving performance evaluations from principals have a significant effect on test scores. One result that might be comforting is that the share of certified teachers is highly correlated with higher test scores, for both language and math. This at least shows that the on-going teacher certification process does identify good teachers.

The results also shows that whether a school is a national standard school or an international standard school does not matter in terms of learning outcomes measured by test scores, and nor does the accreditation of a school. This may indicate the weakness of one of most important aspects of the school quality assurance system in Indonesia.

[7] One puzzling result is that schools that send school performance report to parents seem to have lower teacher attendance. But again, "school performance" is not well defined in the survey.
[8] Full results of 2nd step estimates are in Annex 3.

Table 3: 2nd step estimates: School outcome

		Bahasa Indonesian Score		Math Score	
		Score_bin		score_mth	
VARIABLES		coef	se	coef	se
D_standard2	Dummy, =1 if school is of Pilot National Standard	-2.793*	(1.674)	-0.386	(1.289)
R_admission	Ratio of application / admission	1.773	(1.497)	2.183*	(1.151)
T_enroll	Total enrollment	-0.0208**	(0.00820)	0.0240***	(0.00630)
bk05_kr07	Principal annual Income (Rp)	6.06e-07**	(2.56e-07)	3.61e-07*	(1.97e-07)
bk09_pj03b	Share of teachers receiving a written performance evaluation from principal	3.028*	(1.584)	1.127	(1.218)
bk09_kg03xC	Share of teachers receiving training from district or subdistrict Education Office	3.360	(2.682)	3.605*	(2.062)
bk09_kg03xD	Share of teachers receiving training from private foundation	5.258*	(3.142)	5.873**	(2.423)
bk09_kg04E	Share of teachers receiving training in: Assessing the performance of your students	1.563	(3.653)	4.918*	(2.819)
bk09_kr12	Share of teachers certified	6.739**	(2.884)	5.276**	(2.226)
exp_hat	Predicted value of school expenditure on students activities	1.91e-07	(1.16e-07)	2.35e-07***	(9.04e-08)
nonPNS_hat	Predicted value of non-PNS teachers	0.912	(0.616)	0.903*	(0.478)
T_attend_hat	Predicted value of teacher attendance	0.130*	(0.0733)	0.113**	(0.0564)
Dedu_parent	Dummy, =1 if parental education at least senior secondary	8.387***	(1.847)	6.258***	(1.419)
bk10_kr05	Parental annual income	1.57e-06***	(4.91e-07)	1.07e-07	(3.77e-07)
Constant		17.08*	(8.842)	4.352	(6.784)
Observations		377		377	
R-squared		0.425		0.368	

V. Conclusions

The global trend of school-based management follows the principle of decentralized decision-making, putting power in the hands of the frontline providers and parents to improve their schools, aiming at improving education beyond providing more classrooms, more teachers, and more textbooks. The idea behind decentralized decision making and management is that the frontline providers and clients know best what they want, and what goes on in schools and other public service provision facilities.

This paper examines the key aspects of the practices of school-based management currently in Indonesia, and its effect on education quality. Using a conceptual framework of an accountability system of public service delivery, this paper explores the relations among parents, school committees, schools, and government education supervisory bodies from three tenets: participation and voice; autonomy; and accountability. The paper's empirical approach allows a close examination of how these aspects affect school decision-making on key educational inputs, which significantly affect student learning outcomes.

Using the data from a nationally representative survey of about 400 public primary schools in Indonesia, the paper finds that the level of parental participation and voice in school management is quite low in Indonesia. While the role of school committees is still limited to community relations, school facilities, and other administrative areas of schools, the school principal, together with teachers, is very much empowered to assert professional control of the school. The most important finding of this paper is that the accountability system is very weak in Indonesia's school system, which is reflected in inadequate information flow to parents, as well as seemingly low parental awareness of holding schools accountable. The accountability arrangement of the Indonesian school system currently puts more emphasis on top-down supervision and monitoring. Even though the interactions between district or subdistrct education offices and schools are generally frequent, the lack of rewards and sanctions for good or bad performance also leaves the system weak.

The empirical work of this paper shows that although the scope of school-based management in Indonesia is limited today, it has begun to help schools make the right decisions on allocation of resources and hiring additional (non-civil servant) teachers, and

to create an enabling environment for learning, including increasing the teacher attendance rate. All these aspects are found to have significantly positive effects on student learning outcomes.

The results of this paper may also contribute to the rethinking of teacher management reforms in Indonesia. Hiring non-civil servant teachers by schools has been controversial as it is often perceived as inadequate spending and waste of resources given that the overall civil servant teachers are more than sufficient in numbers relative to the total number of students. In the meantime, an increasing number of non-civil service teachers are queuing to become civil service teachers, creating pressure on expanding the size of the civil service. The findings of this paper show that rather than in an ad hoc manner, schools do hire non-civil service teachers in compensation for the smaller numbers (relatively) of civil-service teachers at school. More importantly, non-civil service teachers contribute significantly to student learning. We argue that this contribution may not be because of the total number of teachers per se, as decreasing the student-pupil ratio from 20:1 (without non-civil service teachers) to 15:1 (with civil service teachers) cannot provide a convincing explanation of the improvement of learning outcomes based on a vast amount of international experience. Rather, non-civil service teachers may have very different characteristics from the current civil service teachers: they are generally younger, and many are fresh from college, and with updated knowledge. They may be also more motivated to earn "job security". These hypotheses are yet to be tested.

References

Abu-Duhou, I. (1999). *School-based Management.* Fundamentals of Educational Planning 62. Paris: UNESCO, International Institute for Educational Planning.

Anderson, J. A. (2005). *Accountability in Education*. Education Policy Series. The International Institute for Educational Planning and The International Academy of Education, Paris and Brussels.

Angrist, J. D., and G. W. Imbens (1995). "Two-Stage Least Squares Estimation of Average Causal Effects in Models with Variable Treatment Intensity." *Journal of the American Statistical Association* 90(430): 431–42.

Bardhan, P. (2002). "Decentralization of Governance and Development." *Journal of Economic Perspectives* 16(4): 185–205.

Barnett, W. S. (1996). "Economics of School Reform." In *Holding Schools Accountable –Performance-based Reform in Education*, ed..

Caldwell, B. J. (2005). *School-based Management*. Education Policy Series. The International Institute for Educational Planning and The International Academy of Education, Paris and Brussels.

Chaudhury, N., J. Hammer, M. Kremer, K. Muralidharan, and H. Rogers. (2006)."Missing in Action: Teacher and Health Worker Absences in Developing Countries." *Journal of Economic Perspectives* 20, no. 1: 91–116.

Di Gropello, E. (2006). "A Comparative Analysis of School-based Management in Central America." World Bank Working Paper No. 72, World Bank, Washington, DC.

Glewwe, P and M. Kremer (2006). "School, Teachers, and Education Outcomes in Developing Countries". In *Handbook of the Economics of Education*, Volume 2.

Hanushek, Eric A., and L. Woessmann (2007)."The Role of Education Quality for Economic Growth" World Bank Policy Research Working Paper Number 4122, World Bank, Washington, DC.

Jalal, F. and B. Musthafa (Eds.) (2001). *Education Reform in the Context of Regional Autonomy: The Case of Indonesia* . Jakarta: Ministry of National Education, National Development Agency and The World Bank.

Jimenez, E., and Y. Sawada (1999) "Do Community-managed Schools Work? An Evaluation of El Salvador's EDUCO Program." *World Bank Economic Review* 13(3): 415–441.

——— (2003). "Does Community Management Help Keep Kids in Schools? Evidence Using Panel Data from El Salvador's EDUCO Program." Discussion Paper CIRJE-F-236, World Bank, Washington, DC.

Ministry of National Education (2002). Keputusan Menteri Pendidikan Nasional Republik Indonesia No. 044/U/2002 tentang Dewan Pendidikan dan Komite Sekolah (The Decree of the Minister of National Education of the Republic of Indonesia number 044/U/2002 concerning Education Council and School Committee". Jakarta.

Ministry of National Education (2007). "Survey of DBEP School Finances".

Rowan, B., E. Camburn, and C. Barnes (2004)."Benefiting from Comprehensive School Reform: A Review of Research on CSR Implementation." In *Putting Pieces Together: Lessons from Comprehensive School Reform Research,* ed. C. Cross. Washington, DC: National Clearinghouse for Comprehensive School Reform.

SMERU Research Institute (2005). "The Implementation of The School Operational Assistance (BOS) Program".

SMERU Research Institute (2008). "The State of Local Governance and Public Services in the Decentralized Indonesia in 2006".

Sumintono, B (2006). "Decentralized Centralism: School-Based Management Policies and Practices at State Secondary Schools in Mataram, Lombok, Indonesia". PhD thesis, Victoria University of Wellington, New Zealand.

Sweeting, E., Muhlisoh, Furaidah, and S. Koes (2003- 07). "Three Studies: Role of School Principal; Role of School Committee; Change in Probolinggo District". Managing Basic Education Project. *http://mbeproject.net/report.html*.

Usman, Syaikhu, Akhmadi, and D. Suryadarma (2004). "When Teachers Are Absent: Where Do They Go and What is the Impact on Students". SMERU Research Institute, Field Report.

Weston, S et al (2007). "Good Practices in Education Management". Jakarta: USAID.

_____ (2008) . "A Study of Junior Secondary Education in Indonesia: A Review of the Implementation of Nine Year Universal Basic Education". Jakarta: USAID.

World Bank (2003). *World Development Report 2004: Making Services Work for Poor People*. Washington, DC: World Bank.

——— (2007a). *What Do We Know About School-Based Management?* Washington, DC: World Bank.

_____ (2007b). *What Is School-Based Management?* Washington, DC: World Bank.

_____ (2009). *Decentralized Decisin-Making in Schools: The Theory and Evidence on School-Based Management*. Washington, DC. World Bank.

Annex 1: Sample Summary Statistics

Variable	Definition	mean	s.e.
Dependent variables:			
bk08_as03E	School budget allocation to student activities (school decision)	8.970e+06	(9.839e+06)
T_nonPNS	Total number of non-civil service teachers (school decision)	3.491	(2.284)
Teacher_attend	Teacher attendance rate (intermediate outcome)	94.93	(16.83)
score_Bin	Bahasa Indonesian test score (school outcome)	45.48	(9.801)
score_mth	Math test score (school outcome)	30.38	(6.807)
Accountability: top down			
_Ibk05_ao01_2	Dummy, =1 if little influential the district/sub district over drafting the school's work plan	0.131	(0.337)
_Ibk05_ao01_3	Dummy, =1 if somewhat influential	0.475	(0.500)
_Ibk05_ao01_4	Dummy, =1 if very influential	0.261	(0.440)
_Ibk05_ao01a2	Dummy, =1 if little influential district/sub district over planning and allocating school's budget	0.172	(0.378)
_Ibk05_ao01a3	Dummy, =1 if somewhat influential	0.352	(0.478)
_Ibk05_ao01a4	Dummy, =1 if very influential	0.191	(0.393)
_Ibk05_ao01b2	Dummy, =1 if little influential district/sub district over assigning teachers to school	0.0836	(0.277)
_Ibk05_ao01b3	Dummy, =1 if somewhat influential	0.324	(0.469)
_Ibk05_ao01b4	Dummy, =1 if very influential	0.454	(0.499)
_Ibk05_ao01c2	Dummy, =1 if little influential district/sub district over determining the content of teacher professional development	0.0888	(0.285)
_Ibk05_ao01c3	Dummy, =1 if somewhat influential	0.501	(0.501)
_Ibk05_ao01c4	Dummy, =1 if very influential	0.319	(0.467)
_Ibk05_ao01d2	Dummy, =1 if little influential district/sub district over selecting textbooks and instructional materials	0.185	(0.389)
_Ibk05_ao01d3	Dummy, =1 if somewhat influential	0.379	(0.486)
_Ibk05_ao01d4	Dummy, =1 if very influential	0.222	(0.416)
bk05_ao03x	Dummy, =1 if principal have attended a meeting with the district education office staff	0.982	(0.134)
Accountability: bottom up:			
_Ibk05_ks03_1	Dummy, =1 if the roles of school committee is to approve policies and make final decisions about how the school operates	0.770	(0.421)

Variable	Definition	mean	s.e.
_Ibk05_ks03a1	Dummy, =1 if the roles of school committee is to provide inputs in the allocation of BOS funds	0.846	(0.361)
bk05_pt01A	Number of times principal received monitoring visit by school Committee member	2.728	(3.645)
bk05_pt01B	Number of times principal received monitoring visit by district or sub-district education supervisor	5.778	(5.002)
bk05_pt07A	Dummy, =1 if school send all parents written information about school performance	0.298	(0.458)
bk05_pt07B	Dummy, =1 if school send all parents written information about use of BOS funds	0.230	(0.421)
bk05_pt07C	Dummy, =1 if school send all parents written information about school committee activities	0.225	(0.418)
bk05_pt07D	Dummy, =1 if school send all parents written information about school and/or student activities	0.517	(0.500)
bk05_kt02A	Dummy, =1 if there is pressure from parents to improve student performance in this school	0.606	(0.489)
D_parent_schlmgmt	Whether parents reps are on school management team	0.345	(0.476)
D_satisfied_schl	Share of parents satisfied or very satisfied on school quality	0.901	(0.152)
D_satisfied_teacher	Share of parents satisfied or very satisfied on teacher	0.932	(0.120)
D_satisfied_mgmt	Share parents satisfied or very satisfied on management	0.913	(0.146)
D_multiple_schl	Share of parents applied multiple schools	0.103	(0.171)
bk10_kt01x	Share of parents with multiple schools in village	0.276	(0.371)
bk06_ks20A	Dummy, =1 if School Committee received information on the school's teachers and their performance	0.595	(0.491)
bk06_ks20B	Dummy, =1 if School Committee received information on students and their performance	0.804	(0.397)
bk06_ks20C	Dummy, =1 if School Committee received information on school's expenditures	0.640	(0.481)
bk06_ks20D	Dummy, =1 if School Committee received information on curriculum, instruction and academic programs	0.488	(0.501)
bk06_ks20E	Dummy, =1 if School Committee received information on extracurricular activities	0.663	(0.473)
bk06_ks20F	Dummy, =1 if School Committee received information on school's facilities	0.791	(0.407)
age_chair	Age of School committee Chairman	49.65	(9.616)
D_edu_chair	Dummy, =1 if School Committee Chair has education senior secondary or above	0.308	(0.462)
bk06_ks08xC	Dummy, =1 if School Committee held meetings with parents and/or community members	0.736	(0.441)
School characteristics and capacity:			
bk08_as03R	School total budget	2.858e+08	(3.015e+08)
		0.0679	(0.252)
		0.133	(0.340)
		0.00522	(0.0722)

Variable	Definition	mean	s.e.
D_accredit	Dummy, =1 if school is accredited	0.726	(0.447)
R_admission	Ratio of application / admission	1.103	(0.313)
T_enroll	Total enrollment	188.2	(133.7)
T_PNS	Number of civil servant teachers	8.974	(4.944)
T_days	Number of schools days in school year 2009-2010	239.3	(35.51)
T_hours_mth	Number of hours of math learning per week for grade 5	5.574	(1.230)
T_hours_Bin	Number of hours for Indonesian language learning per week for grade 5 for	5.574	(1.280)
bk05_kr07	Principal annual Income (Rp)	4.135e+06	(1.837e+06)
bk05_kr10a	Years of being principal (at this school)	3.901	(3.866)
bk05_kr10b	Years being principal (at any school, including this school	7.862	(7.429)
bk05_kr12	Dummy, =1 if principal is certified	0.522	(0.500)
bk05_pc01	Dummy, =1 if school has a management team	0.590	(0.492)
bk05_pc08A	Dummy, =1 if school receives assistance from province education staff in drafting the school work plan	0.209	(0.407)
bk05_pc08B	Dummy, =1 if school receives assistance from District or sub-district education staff	0.645	(0.479)
bk05_pc08C	Dummy, =1 if school receives assistance from Private foundations/donors	0.0261	(0.160)
bk05_pc08D	Dummy, =1 if school receives assistance from Others	0.117	(0.322)
bk05_ao04A	Dummy, =1 if Principal received training for developing school vision, mission, and/or goals	0.418	(0.494)
bk05_ao04B	Dummy, =1 if Principal received training for developing/revising school's work plan	0.501	(0.501)
bk05_ao04C	Dummy, =1 if Principal received training for guiding the development and evaluation ofthe school's curriculum	0.525	(0.500)
bk05_ao04D	Dummy, =1 if Principal received training for implement BOS program and use of BOS funds	0.721	(0.449)
bk05_ao04E	Dummy, =1 if Principal received training for Planning and managing school budgets and finances	0.522	(0.500)
bk05_ao04F	Dummy, =1 if Principal received training for supervising and evaluating teachers	0.501	(0.501)
bk05_ao04G	Dummy, =1 if Principal received training for involving parents and community members in supporting the school	0.321	(0.468)
bk05_ao04H	Dummy, =1 if Principal received training for working with the School Committee	0.462	(0.499)
bk05_pt05B	Frequency of principal meet with teachers to discuss student performance	4.303	(1.145)
Dfemale	Dummy, =1 if school principal is female	0.337	(0.473)
age	Principal’s age	51.08	(5.418)
bk09_pj03a	Share of teachers receiving an oral performance evaluation from principal	0.635	(0.245)
bk09_pj03b	Share of teachers receiving a written performance evaluation from principal	0.486	(0.289)
bk09_kg03xA	Share of teachers receive training from national government	0.0631	(0.109)
bk09_kg03xB	Share of teachers receiving training province government	0.152	(0.177)
bk09_kg03xC	Share of teachers receiving training from district or subdistrict Education Office	0.349	(0.263)

Variable	Definition	mean	s.e.
bk09_kg03xD	Share of teachers receiving training from private foundation	0.123	(0.172)
bk09_kg03xE	Share of teachers receiving training from KKG or MGMP	0.0383	(0.0956)
bk09_kg04A	Share of teachers receiving training in: Handling classroom management and discipline situations	0.232	(0.208)
bk09_kg04B	Share of teachers receiving training in: Planning lessons more effectively	0.408	(0.268)
bk09_kg04C	Share of teachers receiving training in: Using a variety of instructional methods	0.398	(0.274)
bk09_kg04D	Share of teachers receiving training in: Teaching your subject matter or grade level	0.361	(0.260)
bk09_kg04E	Share of teachers receiving training in: Assessing the performance of your students	0.336	(0.244)
bk09_kg04F	Share of teachers receiving training in: Assessing school needs and setting school goals	0.203	(0.192)
bk09_kg04G	Share of teachers receiving training in: Preparing the school's work plan	0.211	(0.191)
bk09_kg04H	Share of teachers receiving training in: Planning for the allocation of BOS funds	0.141	(0.157)
bk09_kr12	Share of teachers certified	0.134	(0.182)
Parental background;			
Dedu_parent	Dummy, =1 if parental education at least senior secondary	0.315	(0.275)
bk10_kr05	Parental annual income	1.378e+06	(988,208)
Observations		383	

Annex 2. 1st Step estimates: School decisions and intermediate outcome (full results of Table 2)

	Expenditure on student *bk08_as03E*		Number of non-PNS teachers *T_nonPNS*		Teacher attendance rate *Teacher_attend*	
VARIABLES	coef	se	coef	se	coef	se
Top down						
_Ibk05_ao01_2	787,390	(2.303e+06)	0.332	(0.511)	1.838	(4.078)
_Ibk05_ao01_3	-243,974	(2.025e+06)	0.495	(0.450)	-3.683	(3.588)
_Ibk05_ao01_4	2.025e+06	(2.215e+06)	-0.322	(0.491)	1.057	(3.921)
_Ibk05_ao01a2	669,106	(1.945e+06)	-0.326	(0.431)	1.295	(3.439)
_Ibk05_ao01a3	-671,492	(1.771e+06)	-0.126	(0.393)	2.251	(3.137)
_Ibk05_ao01a4	4.201e+06**	(2.078e+06)	0.0878	(0.460)	3.702	(3.675)
_Ibk05_ao01b2	642,764	(2.382e+06)	-0.159	(0.529)	-0.698	(4.219)
_Ibk05_ao01b3	1.506e+06	(1.888e+06)	-0.00788	(0.419)	-0.953	(3.346)
_Ibk05_ao01b4	1.254e+06	(1.874e+06)	0.0188	(0.416)	-1.636	(3.321)
_Ibk05_ao01c2	647,193	(2.757e+06)	-0.0428	(0.612)	0.466	(4.885)
_Ibk05_ao01c3	1.647e+06	(2.357e+06)	-0.336	(0.523)	7.359*	(4.175)
_Ibk05_ao01c4	-1.128e+06	(2.550e+06)	-0.352	(0.566)	9.723**	(4.518)
_Ibk05_ao01d2	-2.088e+06	(1.870e+06)	0.592	(0.415)	-5.588*	(3.312)
_Ibk05_ao01d3	-1.340e+06	(1.719e+06)	0.680*	(0.381)	-2.998	(3.045)
_Ibk05_ao01d4	-1.403e+06	(2.052e+06)	0.868*	(0.456)	-6.011*	(3.636)
bk05_ao03x	4.834e+06	(4.212e+06)	1.961**	(0.935)	-1.277	(7.462)
Bottom up:						
_Ibk05_ks03_1	524,778	(1.274e+06)	-0.124	(0.283)	-1.716	(2.255)
_Ibk05_ks03a1	2.172e+06	(1.534e+06)	-0.254	(0.340)	4.795*	(2.718)
bk05_pt01A	964.9	(160,086)	0.0441	(0.0355)	-0.255	(0.284)
bk05_pt01B	-13,367	(109,077)	-0.0321	(0.0242)	0.291	(0.193)
bk05_pt07A	-706,430	(1.274e+06)	0.377	(0.283)	-6.539***	(2.256)
bk05_pt07B	2.432e+06*	(1.450e+06)	0.00623	(0.321)	0.712	(2.566)
bk05_pt07C	1.637e+06	(1.488e+06)	-0.565*	(0.330)	1.829	(2.637)
bk05_pt07D	430,782	(1.195e+06)	0.0874	(0.265)	-1.919	(2.116)
bk05_kt02A	-22,930	(1.186e+06)	0.273	(0.263)	3.165	(2.102)
D_parent_schlmgmt	-1.176e+06	(1.450e+06)	-0.0781	(0.322)	-1.970	(2.569)
D_satisfied_schl	6.999e+06	(5.510e+06)	1.589	(1.220)	-15.21	(9.734)
D_satisfied_teacher	-3.527e+06	(6.643e+06)	-1.267	(1.466)	-8.321	(11.70)
D_satisfied_mgmt	-328,801	(4.930e+06)	0.413	(1.082)	8.663	(8.638)
D_multiple_schl	587,110	(3.319e+06)	-0.776	(0.737)	-6.763	(5.881)
bk10_kt01x	552,902	(1.584e+06)	0.0413	(0.351)	-2.860	(2.805)
bk06_ks20A	-2.048e+06	(1.357e+06)	-0.0605	(0.300)	4.061*	(2.396)
bk06_ks20B	2.029e+06	(1.770e+06)	0.713*	(0.393)	-4.641	(3.137)
bk06_ks20C	-1.175e+06	(1.285e+06)	0.151	(0.285)	-2.067	(2.274)
bk06_ks20D	442,438	(1.301e+06)	-0.177	(0.288)	0.148	(2.301)
bk06_ks20E	301,364	(1.516e+06)	-0.00272	(0.333)	0.232	(2.658)
bk06_ks20F	454,486	(1.751e+06)	0.231	(0.385)	-2.556	(3.071)
age_chair	-27,396	(57,469)	-0.0109	(0.0128)	0.207**	(0.102)
D_edu_chair	2.158e+06*	(1.227e+06)	-0.0288	(0.272)	4.001*	(2.172)
bk06_ks08xC	-256,234	(1.333e+06)	-0.515*	(0.296)	3.624	(2.360)
School characteristics and capacity:						
bk08_as03R	0.0141***	(0.00243)	9.13e-10*	(5.38e-10)	8.21e-09*	(4.29e-09)
D_standard2	-631,119	(2.082e+06)	-0.256	(0.454)	2.243	(3.625)
D_standard3	1.778e+06	(1.627e+06)	0.0206	(0.361)	4.234	(2.882)

	Expenditure on student		Number of non-PNS teachers		Teacher attendance rate	
	bk08_as03E		*T_nonPNS*		*Teacher_attend*	
VARIABLES	coef	se	coef	se	coef	se
D_standard4	8.393e+06	(7.523e+06)	2.012	(1.670)	9.017	(13.33)
D_accredit	-1.335e+06	(1.207e+06)	0.871***	(0.268)	2.312	(2.135)
R_admission	-1.672e+06	(1.865e+06)	-0.343	(0.414)	2.797	(3.305)
T_enroll	38,275***	(6,037)	0.00757***	(0.00134)	-0.0151	(0.0107)
T_PNS	215,647	(179,504)	-0.170***	(0.0398)	0.213	(0.318)
T_days	14,414	(16,341)	-0.00536	(0.00363)	0.0360	(0.0290)
T_hours_mth	-662,914	(756,504)	0.178	(0.168)	-0.554	(1.340)
T_hours_Bin	-37,975	(720,110)	-0.0545	(0.160)	0.00336	(1.275)
bk05_kr07	-0.254	(0.321)	-1.06e-07	(7.13e-08)	2.80e-07	(5.69e-07)
bk05_kr10a	185,117	(171,412)	0.0211	(0.0380)	-0.110	(0.303)
bk05_kr10b	-135,374	(91,996)	-0.00309	(0.0204)	-0.117	(0.163)
bk05_kr12	1.550e+06	(1.182e+06)	0.113	(0.262)	1.901	(2.092)
bk05_pc01	-294,679	(1.411e+06)	0.342	(0.313)	-0.711	(2.500)
bk05_pc08A	1.208e+06	(1.386e+06)	0.171	(0.307)	-2.395	(2.452)
bk05_pc08B	-899,001	(1.201e+06)	-0.176	(0.267)	3.522*	(2.128)
bk05_pc08C	-843,199	(3.343e+06)	1.179	(0.742)	-14.25**	(5.924)
bk05_pc08D	-877,643	(1.648e+06)	0.161	(0.364)	-2.593	(2.905)
bk05_ao04A	-1.363e+06	(1.248e+06)	-0.257	(0.277)	1.305	(2.209)
bk05_ao04B	1.020e+06	(1.280e+06)	0.184	(0.284)	-0.527	(2.267)
bk05_ao04C	1.404e+06	(1.449e+06)	0.178	(0.321)	-2.476	(2.564)
bk05_ao04D	-2.033e+06	(1.507e+06)	-0.117	(0.335)	-0.375	(2.671)
bk05_ao04E	895,680	(1.437e+06)	-0.156	(0.318)	-0.880	(2.540)
bk05_ao04F	-403,219	(1.321e+06)	0.145	(0.293)	-1.318	(2.339)
bk05_ao04G	-2.383e+06	(1.518e+06)	-0.119	(0.337)	6.273**	(2.686)
bk05_ao04H	841,446	(1.405e+06)	0.168	(0.311)	-2.637	(2.482)
bk05_pt05B	-56,911	(482,502)	-0.0798	(0.107)	0.582	(0.855)
Dfemale	-1.256e+06	(1.190e+06)	-0.546**	(0.263)	2.689	(2.101)
age	-152,927	(116,072)	-0.0522**	(0.0256)	0.710***	(0.205)
bk09_pj03a	-21,276	(2.255e+06)	-1.070**	(0.500)	1.370	(3.995)
bk09_pj03b	3.341e+06*	(1.943e+06)	0.0514	(0.431)	-1.043	(3.440)
bk09_kg03xA	-1.573e+06	(5.332e+06)	-0.405	(1.184)	16.64*	(9.447)
bk09_kg03xB	5.262e+06	(3.418e+06)	-0.0174	(0.758)	-15.17**	(6.047)
bk09_kg03xC	-8.056e+06**	(3.318e+06)	-0.109	(0.736)	-1.566	(5.878)
bk09_kg03xD	-4.497e+06	(3.939e+06)	-0.159	(0.873)	1.216	(6.971)
bk09_kg03xE	7.402e+06	(6.085e+06)	-0.206	(1.350)	-6.187	(10.78)
bk09_kg04A	-3.902e+06	(4.124e+06)	-2.675***	(0.915)	-5.592	(7.306)
bk09_kg04B	-608,698	(4.981e+06)	-0.196	(1.105)	20.46**	(8.816)
bk09_kg04C	4.044e+06	(4.796e+06)	-0.0553	(1.065)	-9.113	(8.497)
bk09_kg04D	-1.471e+06	(4.483e+06)	1.650*	(0.995)	-3.291	(7.938)
bk09_kg04E	-2.005e+06	(4.576e+06)	-0.548	(1.016)	1.433	(8.107)
bk09_kg04F	1.134e+06	(4.660e+06)	0.256	(1.034)	1.337	(8.254)
bk09_kg04G	4.753e+06	(4.579e+06)	0.975	(1.017)	-7.142	(8.113)
bk09_kg04H	4.733e+06	(4.499e+06)	0.224	(0.999)	15.51*	(7.970)
bk09_kr12	3.019e+06	(3.349e+06)	0.254	(0.743)	-5.410	(5.929)
Constant	-1.952e+06	(9.688e+06)	5.305**	(2.146)	42.88**	(17.12)
Observations	383		384		384	
R-squared	0.627		0.346		0.287	

Annex 3: 2nd step estimates: School outcome (full results of Table 3)

	Bahasa Indonesian Score		Math Score	
	Score_bin		score_mth	
VARIABLES	coef	se	coef	se
unitbudget	1.41e-07	(1.35e-07)	-5.12e-08	(1.04e-07)
D_standard2	-2.793*	(1.674)	-0.386	(1.289)
D_standard3	-1.699	(1.276)	-1.540	(0.981)
D_standard4	-5.524	(6.161)	-5.062	(4.729)
D_accredit	-1.110	(1.107)	-1.135	(0.852)
R_admission	1.773	(1.497)	2.183*	(1.151)
T_enroll	-0.0208**	(0.00820)	0.0240***	(0.00630)
T_PNS	0.255	(0.189)	0.0529	(0.148)
T_days	0.000524	(0.0126)	-0.00439	(0.00974)
T_hours_mth			0.329	(0.283)
T_hours_Bin	-0.460	(0.344)		
bk05_kr07	6.06e-07**	(2.56e-07)	3.61e-07*	(1.97e-07)
bk05_kr10a	-0.0522	(0.131)	0.162	(0.100)
bk05_kr10b	0.00402	(0.0730)	-0.0457	(0.0561)
bk05_kr12	0.413	(0.983)	-0.105	(0.755)
bk05_pc01	0.802	(0.879)	-0.293	(0.679)
bk05_pc08A	-1.361	(1.114)	-0.797	(0.858)
bk05_pc08B	0.314	(0.996)	-0.774	(0.765)
bk05_pc08C	-2.952	(2.765)	-2.002	(2.128)
bk05_pc08D	1.263	(1.275)	-1.046	(0.981)
bk05_ao04A	-1.005	(1.005)	0.340	(0.773)
bk05_ao04B	1.659	(1.012)	0.256	(0.781)
bk05_ao04C	-0.447	(1.132)	0.172	(0.867)
bk05_ao04D	0.264	(1.166)	0.609	(0.898)
bk05_ao04E	-0.800	(1.150)	0.932	(0.882)
bk05_ao04F	0.445	(1.031)	-0.181	(0.793)
bk05_ao04G	-1.914	(1.271)	-1.245	(0.977)
bk05_ao04H	0.412	(1.137)	-0.268	(0.874)
bk05_pt05B	0.270	(0.378)	-0.0357	(0.291)
Dfemale	0.752	(0.969)	1.156	(0.747)
age	0.0321	(0.105)	0.0849	(0.0806)
bk09_pj03a	-1.536	(1.867)	1.115	(1.435)
bk09_pj03b	3.028*	(1.584)	1.127	(1.218)
bk09_kg03xA	2.693	(4.312)	4.482	(3.316)
bk09_kg03xB	-0.883	(3.014)	0.474	(2.317)
bk09_kg03xC	3.360	(2.682)	3.605*	(2.062)
bk09_kg03xD	5.258*	(3.142)	5.873**	(2.423)
bk09_kg03xE	7.926	(5.597)	2.963	(4.307)
bk09_kg04A	3.844	(3.650)	2.107	(2.804)
bk09_kg04B	4.328	(4.106)	1.093	(3.157)
bk09_kg04C	1.503	(3.812)	-0.985	(2.933)
bk09_kg04D	-4.693	(3.529)	-2.666	(2.713)
bk09_kg04E	1.563	(3.653)	4.918*	(2.819)
bk09_kg04F	-1.062	(3.678)	-2.848	(2.840)
bk09_kg04G	-5.829	(3.778)	-2.912	(2.905)
bk09_kg04H	-0.861	(3.685)	-2.497	(2.833)
bk09_kr12	6.739**	(2.884)	5.276**	(2.226)
exp_hat	1.91e-07	(1.16e-07)	2.35e-07***	(9.04e-08)
nonPNS_hat	0.912	(0.616)	0.903*	(0.478)
T_attend_hat	0.130*	(0.0733)	0.113**	(0.0564)
Dedu_parent	8.387***	(1.847)	6.258***	(1.419)
bk10_kr05	1.57e-06***	(4.91e-07)	1.07e-07	(3.77e-07)
Constant	17.08*	(8.842)	4.352	(6.784)
Observations	377		377	
R-squared	0.425		0.368	